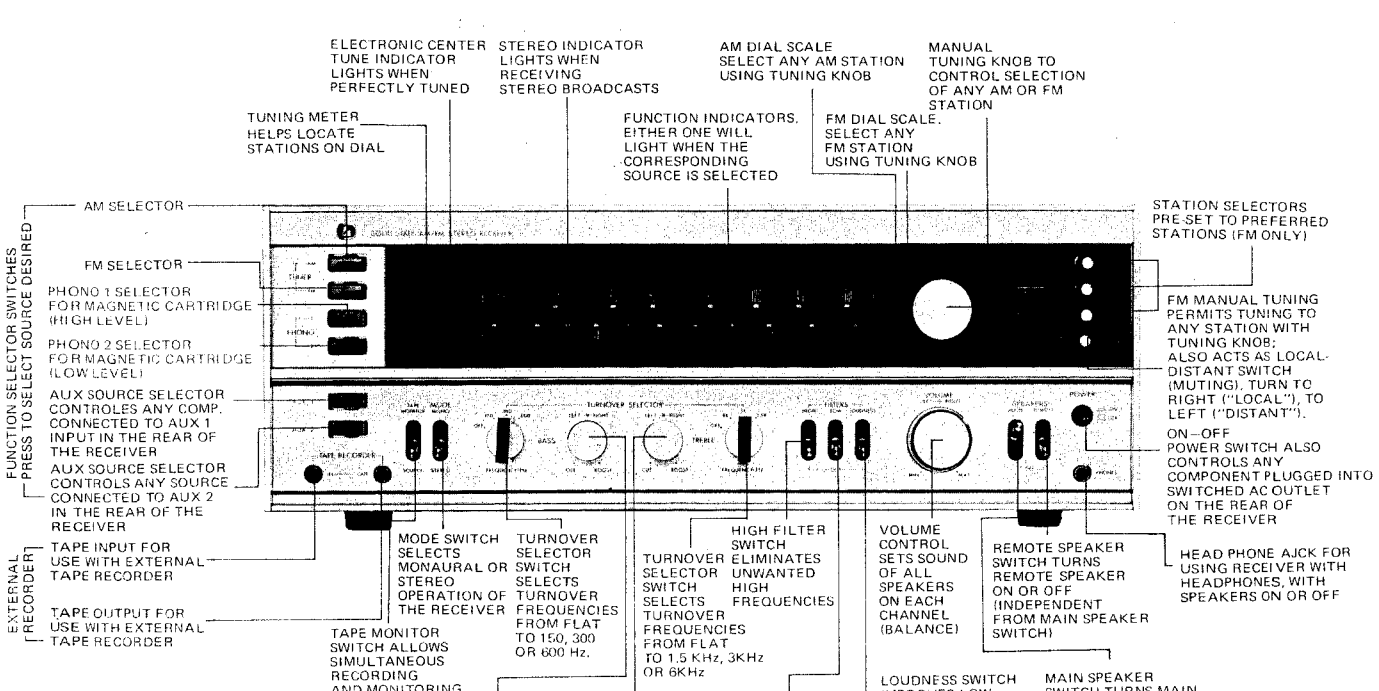
LUXMAN

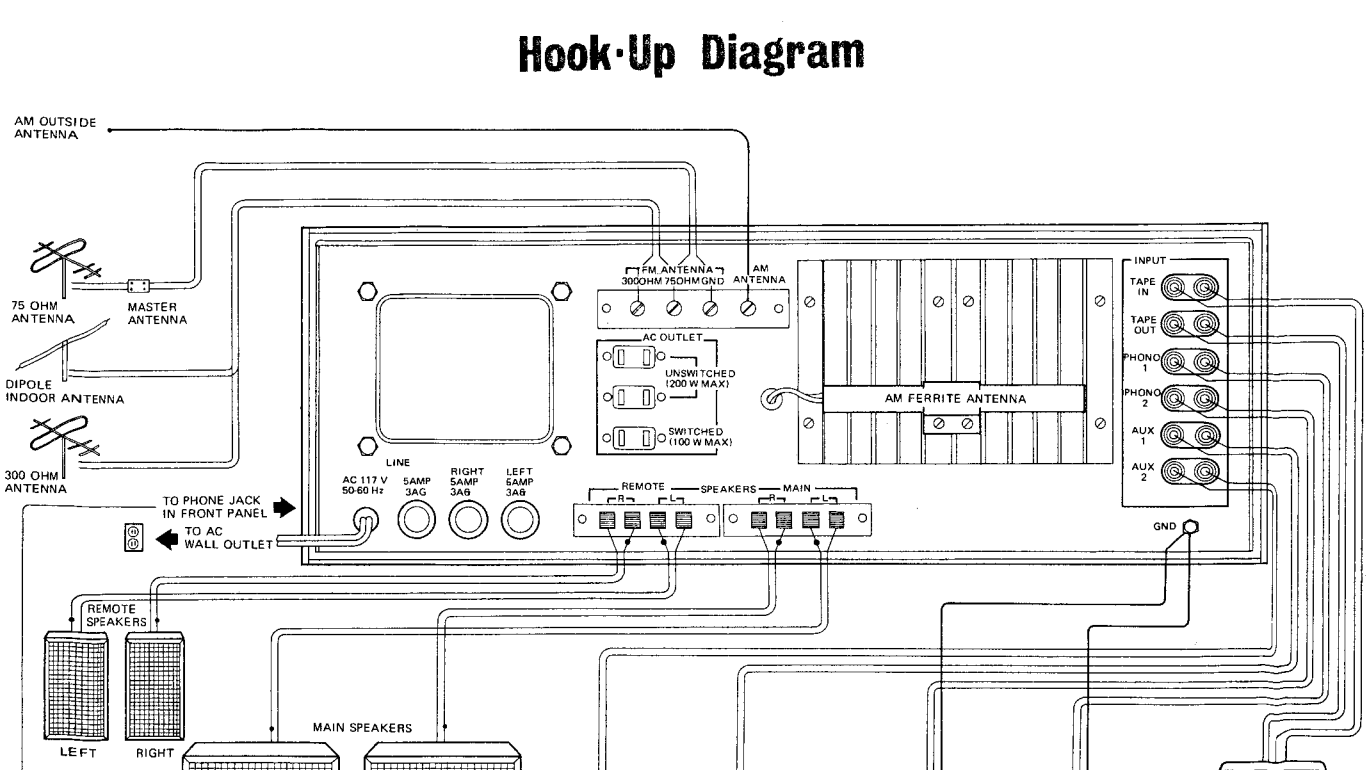
FQ900

SERVICE MANUAL

Front Panel Controles


ELECTRONIC CENTER TUNE INDICATOR LIGHTS WHEN PERFECTLY TUNED
STEREO INDICATOR LIGHTS WHEN RECEIVING STEREO BROADCASTS
AM DIAL SCALE SELECT ANY AM STATION USING TUNING KNOB
MANUAL TUNING KNOB TO CONTROL SELECTION OF ANY AM OR FM STATION
TUNING METER HELPS LOCATE STATIONS ON DIAL
FUNCTION INDICATORS. EITHER ONE WILL LIGHT WHEN THE CORRESPONDING SOURCE IS SELECTED
FM DIAL SCALE. SELECT ANY FM STATION USING TUNING KNOB
AM SELECTOR
FUNCTION SELECTOR SWITCHES PRESS TO SELECT SOURCE DESIRED
FM SELECTOR
PHONO 1 SELECTOR FOR MAGNETIC CARTRIDGE (HIGH LEVEL)
PHONO 2 SELECTOR FOR MAGNETIC CARTRIDGE (LOW LEVEL)
AUX SOURCE SELECTOR CONTROLES ANY COMP. CONNECTED TO AUX 1 INPUT IN THE REAR OF THE RECEIVER
AUX SOURCE SELECTOR CONTROLS ANY SOURCE CONNECTED TO AUX 2 IN THE REAR OF THE RECEIVER
EXTERNAL [RECORDER]
TAPE INPUT FOR USE WITH EXTERNAL TAPE RECORDER
TAPE OUTPUT FOR USE WITH EXTERNAL TAPE RECORDER
STATION SELECTORS PRE-SET TO PREFERRED STATIONS (FM ONLY)
FM MANUAL TUNING PERMITS TUNING TO ANY STATION WITH TUNING KNOB; ALSO ACTS AS LOCAL-DISTANT SWITCH (MUTING). TURN TO RIGHT ("LOCAL"), TO LEFT ("DISTANT").
ON–OFF POWER SWITCH ALSO CONTROLS ANY COMPONENT PLUGGED INTO SWITCHED AC OUTLET ON THE REAR OF THE RECEIVER
HEAD PHONE AJCK FOR USING RECEIVER WITH HEADPHONES, WITH SPEAKERS ON OR OFF
MODE SWITCH SELECTS MONAURAL OR STEREO OPERATION OF THE RECEIVER
TURNOVER SELECTOR SWITCH SELECTS TURNOVER FREQUENCIES FROM FLAT TO 150, 300 OR 600 Hz.
TURNOVER SELECTOR SWITCH SELECTS TURNOVER FREQUENCIES FROM FLAT TO 1.5 KHz, 3KHz OR 6KHz
HIGH FILTER SWITCH ELIMINATES UNWANTED HIGH FREQUENCIES
VOLUME CONTROL SETS SOUND OF ALL SPEAKERS ON EACH CHANNEL (BALANCE)
REMOTE SPEAKER SWITCH TURNS REMOTE SPEAKER ON OR OFF (INDEPENDENT FROM MAIN SPEAKER SWITCH)
TAPE MONITOR SWITCH ALLOWS SIMULTANEOUS RECORDING AND MONITORING
BASS CONTROL KNOB TO SET LOW FREQUENCY RESPONESE (EACH CHANNEL)
TREBLE CONTROL KNOB TO SET HIGH FREQUENCY RESPONSE (EACH CHANNEL)
LOW FILTER SWITCH ELIMINATES UNWANTED LOW FREQUENCIES
LOUDNESS SWITCH IMPROVES LOW AND HIGH FREQUENCIES AT LOW VOLUME LEVEL
MAIN SPEAKER SWITCH TURNS MAIN SPEAKERS ON OR OFF (INDEPENDENT FROM REMOTE SPEAKER SWITCH)

Hook·Up Diagram



CIRCUIT DESCRIPTION

GENERAL

The FQ900 is all solid state high-fidelity receiver. It consists of an AM/FM/FM-Stereo transistorized radio tuner, and a dual channel transistorized highpower audio-amplifier. The circuitry used in this instrument is mostly integrated in eleven circuit boards.

FM TUNER

The RF-amplifier stage, with an untuned antenna circuit, uses a 8F224 transistor in a common-emitter circuit configuration to obtain the highest stable gain over the entire FM broadcast frequency range. The mixer stage, succeeding to a double-tuned interstage selectivity block, is designed to minimize the spurious responses and noise figure. The SF8636 mixer transistor (field-effect transistor) operates in the common-source configuration with both the RF and local-oscillator signals applied to the gate terminal. The input circuit is tapped down by a 5.6-picofarad capacitor in series with the device input capacitor to improve dynamic range. The trap consisting of a 0.6-microhenry inductor (L105) and 470-picofarad capacitor (C109) is designed to bypass any 10.7-MHz component that may appear at the input to the mixer. The BF105 local oscillator transistor is operated in a common-collector circuit that generates a clean oscillator wave form to minimize the generation of spurious responses. The 10.7-MHz IF output from the mixer is coupled to the first IF-amplifier stage by means of a dobule-tuned transformer T101. In the interstage and local-oscillator circuit, each resonant circuit has a varactor-diode instead of a conventional variable-capacitor. Tuning is accomplished by varying the reverse bias voltage to the varactor-diodes.

IF-AMPLIFIER

The IF-amplifier uses two CA3043 integrated-circuits and a CA3053 integrated-circuit to provide 180-dB of stable gain. The selectivity stages are two crystal-filters with two crystals in conjunction with two inductance-capacitance tuned circuits for each filter. The IF portion of the CA3043 integrated-circuit consists of four differential amplifiers in cascade. Each differential pair is isolated from the succeeding pair by a common-collector stage used as a buffer. The final differential pair is powered by a constant-current transistor. The amplifier section provides 80-dB total voltage gain at 10.7-MHz, and features an output stage with exceptionally good limiting characteristics because of its transistor constant-current sink. The audio amplifier in cascaded common-collector configulation is used as a switch for the audio muting. The power supply section provides zener-regulated, decoupled voltages for the IF-amplifier and audio amplifier sections. The CA3053 integrated-circuit is a basic differential amplifier with constant-current transistor that provides 23-dB voltage gain. A balanced ratio detector which substrate is biased for operation to the center-tune indicator circuit, demodulates the frequency-modulated signal into an audio signal.

CENTER-TUNE INDICATOR and MUTING CIRCUIT

The FM IF-signal, extracted from the output of the first crystal-filter, is amplified by Q307 buffer amplifier to drive the rectifier D306 and associated components. The AM IF-signal, taken from the emitter resistor connected to the Q204, is amplified by Q304 to drive the rectifier D303 and associated components. The outputs of those circuits are positive DC voltage proportional to the carrier level. Those DC voltages are applied to the TUNING METER and Q308–5 on the CENTER-TUNE indicator and muting circuit with both outputs connected in series. When the FUNCTION SELECTOR switch is in FM position, as the AM tuner is not powered, this DC voltage is proportional only to the FM carrier level. While in the AM position, as the FM tuner is not powered, the DC voltage depends on the AM carrier level. During operation, forward bias is applied to the amplifier Q308–5 through the bias network. When interstation noise or insufficient signal is available the cumulate voltage, consisting of the preset forward bias and the positive voltage developed by the rectifier circuit, is insufficient to make Q308–5 conduction. And Q308–4 conducts on saturation and Q310 has a lower emitter voltage than the emitter voltage of Q308–4. Since the emitter voltage of Q308–4 is maintained at the same voltage as that of Q312 the lower gate transistor by the constant-voltage transistor Q315, the emitter voltage of Q310, coupled to the lower gate transistor Q312 is insufficient to overcome the sustain voltage on Q312. Therefore Q312 is gated off, and the state of the series gate is in absolutely off. The presence of an acceptable signal level makes the base voltage to Q308–5 large enough to overcome the sustain voltage on Q308–5. Then Q308–5, Q308–4, Q310, and Q312 are driven to alternate states. The forward bias to Q308–5 is fixed by VR303 in DISTANT position. As the forward bias is reduced by shunting to VR902 in LOCAL position, larger carrier level is required to overcome the sustain voltage on Q308–5. DC output of the 10.7-MHz ratio detector is coupled to the base of Q308–2 and DC output of the 455-KHz ratio detector is coupled to the base of Q308–1. A 455-KHz IF-signal, taken from the secondary winding of the T302, is applied to the limiter-amplifier Q305 and Q306 to drive the 455-KHz ratio detector. Q308–1 and Q308–2 operate as a differential amplifier. These transistors are biased separately by the respective bias network so that the both collector voltages are in the same value and 0.5-volt below the emitter voltage of Q308–3 simultaneously when there is zero DC at the ratio detector (i.e., the point of perfect tuning or the point of interstation). As a result, Q308–3 is off and Q309 is on. In this case, the emitter voltage of Q309 coupled to the upper gate transistor Q311 is large enough to make Q311 on. A positive or negative output of the ratio detector triggers this circuit as follows. Assume a positive input to Q308–1, the transistor conducts more heavily, its collector voltage drops and alternatively the collector voltage of the other side of the differential pair Q308–2 rises. When its collector voltage exceeds the preset voltage, current flows to the base of Q308–3 through the diode D307 and Q308–3 is driven to conduction. As Q308–3 conducts on saturation, the emitter voltage of Q309 is lower than what is required Q311 to conduct. When the set is detuned to produce a negative output, Q308–1 conducts less and a current flows to the base of

Q308–3 through the diode D308. In this case, as noted above, Q311 cuts off. Similar sequent as previously described is taken place when a negative or positive input is applied to Q308–2. Transistors Q313 and Q314 comprise a Schmitt trigger generating a step voltage for the muting and center-tune lamp circuits. An output voltage from the series gate transistors Q311 and Q312 is applied to the base of Q313. When both of those transistors are gated on at the same time, the Schmitt trigger circuit is driven to the alternate state and Q313 is turned on. In this state, the lamp driver transistor Q902 and the switch transistors Q301–13, 14 and Q303–13, 14 are properly biased and allow the audio signal to pass to the succeeding stages. Transistor Q001 is a click suppressor. It mutes click noises that occur at the moment of switching the FM presetter. Q001 is biased to conduct on saturation under usual operation so that there is no influences of Q001 to nomal operation of whole circuits previously described. At the moment of switching presetter, the transient contact assembled in presetter reduces the bias which is applied to the base of Q001 to zero. It corresponds to a negative input to Q308–1. Therefore, switch transistors Q303–13, 14 are gated off to provide clickless operation.

MULTIPLEX DECODER

The composite multiplex signal from the ratio detector is applied to the base of transistor Q401. Q401 is an isolation stage which provides a high impedance load for the ratio detector and a low impedance source for the SCA and pilot carrier filter. The composite multiplex signal is extracted from its emitter circuit and the 19-KHz pilot signal is taken from a tuned circuit in the collector circuit. The 19-KHz pilot signal, separated by the tuned coupling circuits T401, is amplified by Q402–4 to drive the frequency doubler. The output of Q402–4 is fed to a balanced full-wave rectifier which consists of D401, D402 and the secondary winding of T402. The output of the rectifier is unfiltered and develops both DC and 38-KHz components. The 38-KHz component is amplified by Q402–1, Q402–2 and appears at the secondary winding of T403. The composite signal taken from the emitter of Q401 is added to the 38-KHz sub-carrier in the secondary winding of T403 through the SCA and pilot carrier filter. The demodulator circuit employs four diodes in a balanced bridge arrangement. The system cancels much of the residual RF products. The 38-KHz pulses switch the composite signal in the switching transformer to produce L and R signals at the output when the sub-carrier has the proper phase with respect to the composite signal. Demodulated L and R signals are applied to audio-amplifiers to improve separation through the T-notch 38-KHz rejection filters and de-emphasis networks. The network that connects the emitters of Q405 and Q407 provides a form of negative feedback between left and right channels. Any residual L signals in the R channels are cancelled out by the signals from the L channel. The same is true on residual R signals in the L channel. VR402 therefore provides the maximum channel separation. VR401 is used to compensate for differences in demodulator effeciency and provide equal overall gain in both channels with respect to the maximum separation. The stereo lamp lights when Q901 is on. Q901 acts as the ground return for the lamp when the transistor is switched into conduction. D407 and associated components in the collector circuit of Q402–1 develops a positive voltage to drive the stereo lamp circuit. A bias network coupled between the collector of Q901 and the demodulator circuit supplies a forward bias current to D403 and D405 when Q901 is off. It prevents increase of distortion caused by inherent non-linearity of diode.

AM TUNER

A ferrite-rod antenna assembly which includes the tuned antenna transformer L201 selects the RF-signal from the desired radio broadcast station and couples it to the base of the Q201 RF-amplifier transistor. D202 and associated components in the collector circuit of the second IF-amplifier develops a negative voltage proportional to the RF input signal. This voltage is applied to the base of the RF-amplifier Q201 as AGC bias. The operating point of the RF-amplifier is chosen so that AGC can be applied effectively. In the converter stage, the RF-signal from the RF-amplifier is mixed with a local oscillator signal to produce a signal at the receiver intermediate frequency of 455KHz. The antenna circuit, RF-amplifier, and converter are tuned together by means of mechanically ganged variable capacitor so that the local oscillator frequency is always 455-KHz above the frequency to which the other circuits are tuned. The 455-KHz signal from the converter stage is amplified by two IF-amplifier stages. The amplified IF-signal is then demodulated in the detector circuit consisting of D201 and associated components. The audio signal from the detector is coupled through the tuned whistle filter to the switch transistors of the muting circuit.

POWER SUPPLY

A regulated power supply provides a stable DC voltage which is applied to the varactors in the FM-tuner as a tuning voltage to prevent frequency drift caused by fluctuation of any voltage. DC output from the rectifier is filtered and applied to the series regulator Q802. Transistor Q804 compares a sample of the output voltage, picked up at VR801, with a reference voltage supplied by the reference diode D806. A change in output voltage results in a change in conduction of Q802 that offsets the original voltage shift. The field effect transistor Q805 which drain is connected to the DC tuning voltage serves as a variable resistor for AFC. If the DC output of the 10.7-MHz ratio detector which is coupled to the gate of Q805 tends to rise with an increase of the intermediate frequency, Q805 conducts more heavily. As the increased currents of the transistor flows through resistors R813, R814 and TH801 which is in series with the load impedance, the voltage drop across the resistors become a larger proportion of the total applied voltage. It causes a decrease of the local oscillator frequency, that is, intermediate frequency because of the drop of the tuning voltage. When the output voltage tends to decrease owing to a decrease of the intermediate frequency, the decrease current of Q805 yields a rise of the tuning voltage, that is, local oscillator frequency. A full-wave bridge rectifier provides positive and negative DC

42 volts across filter-capacitors C011 and C012. Q801 serves as an electronic filter to supply well filtered 24 volts and 20 volts power to the preamplifier to improve the signal-to-noise ratio in the audio amplifiers. R804 determines the conduction of Q801 and therefore the output voltage as well. The filter capacitor in the base circuit of Q801 acts as an equivalent to a much larger capacitor across the output. A DC power supply is prepared for the dial illuminations and the other indicator lamps.

EQUALIZER AMPLIFIER

This stage has the function to amplify up to a high level according to RIAA equalizer characteristics the signal of the magnetic cartridge, which comes through the input terminal PHONO 1 and PHONO 2.
As to the gain 2mV is amplified up to 80mV and becomes the supply signal to the following stage as well as the signal to the recording terminal (Tape Out). This stage mainly consists of IC of differential driving amplifier system μA739C.

EMITTER FOLLOWER STAGE

The signal passes through this emitter follower stage, which consists of Q_{501} and Q_{502} (NPN transistor 2SC693GU), when the function switch is set at FM, AM, AUX 1 or AUX 2.
The gain is almost 0dB and the signal is taken out at low output impedance, which becomes the recording terminal signal as well as what is supplied to the next stage just like an equalizer.

TAPE OUT TERMINALS

The output terminals for recording to tape recorder, consisting of 2 channels: A jack in the front panel and a pin jack terminal on the back side.
Signal voltage of about 80mV can be obtained at the rated input.
Output impedance in kept sufficiently low below 100 Ω.

TAPE IN TERMINALS

Line output of tape deck can be reproduced from these terminals, 2 channels one in front and another on back side as well.
Standard input level is 80mV and impedance is about 50KΩ.

TAPE MONITOR SWITCHES SW_{1a} SW_{1b}

Setting this switch at the 'in' position allows reproduction from the tape-in terminals.
In case of 3-head tape deck, sound play-back and recording can be simultaneously performed.

VOLUME CONTROL, BALANCE CONTROL

This knob of double-friction construction which controls volume level allows separate adjustment of gain for right and left channels.
The outer knob is for the left channel, while the inner for right.
Both knobs usually move together by ordinary turning and in case you want to get more gain only on right channel, turn clockwise the knob for right channel keeping that for left channel fixed by hand.

MODE SWITCH (SW_4)

This switch is used for selection of reproduction mode, Stereo or Mono.

LOUDNESS CONTROL (SW_{3a}, SW_{3b})

By switching these knobs, loudness circuit annexed to volume control is put into operation and adjustment of low frequency can be made according to the sound volume. When the volume is reduced by 30dB, the value of change is 7dB at 100Hz and 12dB at 50Hz.

LOW CUT FILTER (SW_{2a}, SW_{2b})

This switch attenuates the frequency below 125Hz at the slope of 6dB per octave.

FLAT AMPLIFIER

This is a 2-stage negative feedback amplifier composed by 2 transistors Q_{601} Q_{603} Q_{602} Q_{604} (2SC693GU) per channel and amplifiers signal level of Tape-Out the via volume control so as to drive the tone control circuit. The gain is approx 19dB.

HIGH CUT FILTER (SW_{5a}, SW_{5b})

The frequency selectivity is given to this NFB loop of 2-stage amplifier, which functions as high cut filter by switching of SW_{5a} and SW_{5b}.
Cut-off slope −6dB/oct. and the cut-off frequency −3dB at 1.5KHz.

TONE CONTROL CIRCUIT

VR_{601} and VR_{602} are tone controls for low frequency. Clockwise turn increases low frequency level while counter-clockwise descreases. Flat response is obtained at the center point.
This knob is also of dual friction construction. Both knobs move together by ordinary turning and turning of one of the knobs changes the response of the related channel. SW_{601} SW_{602} are switches for selection of turn-over (or roll-off) frequency for bass control. These switches are operated in conjuction with bass level set. Any frequency among 600, 300 and 150Hz can be selected as the turn-over (or roll-off) point. By setting the switches at flat position, the level control becomes no more effective and the flat response is always obtained.
The same is applicable to treble control with VR_{603} VR_{604} and the turn-over (roll-off) points selectable at 6KHz, 3KHz and 1.5KHz by SW_{603} SW_{604}.
This circuit belongs to NFB category which changes collector and base feed-back of Q_{606} Q_{608} and Q_{607} Q_{609} (2SC693), giving them frequency selectivity.

POWER AMPLIFIER

The construction of this amplifier is direct coupling differential driving complementary system with RMS output 50W + 50W (at 8 Ω), Harm. Distortion 0.2% Power

Bandwidth at 15Hz-30KHz, dual power supply system (+42V–42V).

The first stage is a differential amplifier circuit with 2 pieces of transistor XA495C (Q_{701} Q_{702} Q_{751} Q_{752}), per channel, which supresses the drift.

As the direct coupling system is adopted in the whole stages up to the output terminal, all the characteristics in the low frequency show excellent performance.

Driver stages Q_{703} Q_{753} are to fully drive the next stage of complementary circuit. Q_{704} Q_{705} Q_{754} Q_{756} which are complementary circuits become an emitter-follower by every half cycle to swing the output stage and play a role as a phase reverser. For Q_{704} Q_{754} have a pair of NPN transistor 2SC959 is used, while for Q_{705} Q_{706} a pain of transistor 2SA606.

Power transistors 2SD218 (Q_{706} Q_{707} Q_{756} Q_{757}) connected to Q_{704} and Darlington circuit constitute semi-complementary circuit.

D_{702} D_{752} are equipped for stabilization of bias circuit and for temperature compensation. VR_{701} VR_{751} are DC balancer to keep the center electric potential at zero. R_{730} R_{780} are the negative feed-back resister and time constant composed by R_{708} C_{704}, R_{758} C_{754} decides the limit of low frequency response.

The circuit having Q_{708} Q_{758} (2SC734) Q_{709} Q_{754} (2SA561) play a role as a circuit protector.

This forms a kind of bridge circuit with the speaker load as its branches, where small load impedance causes Q_{708} and Q_{709} to be "on" and the signal is not fed to the output stage.

This power amplifier has various circuits for stabilization of high frequency, L(1.5μH) R_{726} R_{727}, C_{708} C_{705} C_{714}, C_{712}.

A fuse (5A) is installed in series with output terminal of power amplifier, which plays a role as a protector of power amplifier and speaker in addition to the protection circuit.

SW_{6a} SW_{6b} SW_{7a} SW_{7b} are switches which control simulataneously or separately the 2 speaker systems of main remote.

The playback sound is always available from speakers irrespective of use of headphone.

AM – FM ALIGNMENT PROCEDURE

INSTRUMENTS REQUIRED

■ Signal Source

1. FM Signal Generator
   (Meguro MSG–278–G or equivalent)
2. Sweep Generator
   (JRC. NJM5217–C or equivalent)
3. Marker Generator
   (Crystal controlled 10.7 MHz oscillator)
4. AM Signal Generator
   (Meguro MSG–221–C or equivalent)
5. FM–Stereo Modulator
   (Meguro MSG–211–D or equivalent)
6. Audio Oscillator
   (10 – 100,000 Hz)

■ Output Indicator

7. Oscilloscope
   (Iwasaki SS–5057–V or equivalent)
8. Vacuum-Tube Voltmeter
   (AC and DC)
9. Distortion Meter

■ Tools

10. Hex head alignment tool.
11. Thin fibre shaft alignment tool.

GENERAL ALIGNMENT CONDITIONS

1. Connect the low side of signal source and the output indicator to the chassis ground as close as possible to the high side connection unless otherwise specified.
2. Signal input should be kept as low as possible to avoid AGC action unless otherwise noted.
3. Markers should be accurate. (Crystal controlled or checked against a crystal calibrator.)
4. The 10.7 MHz marker used in each section of the alignment should be the same.
5. Marker insertion and amplitude should not distort the oscilloscope trace.

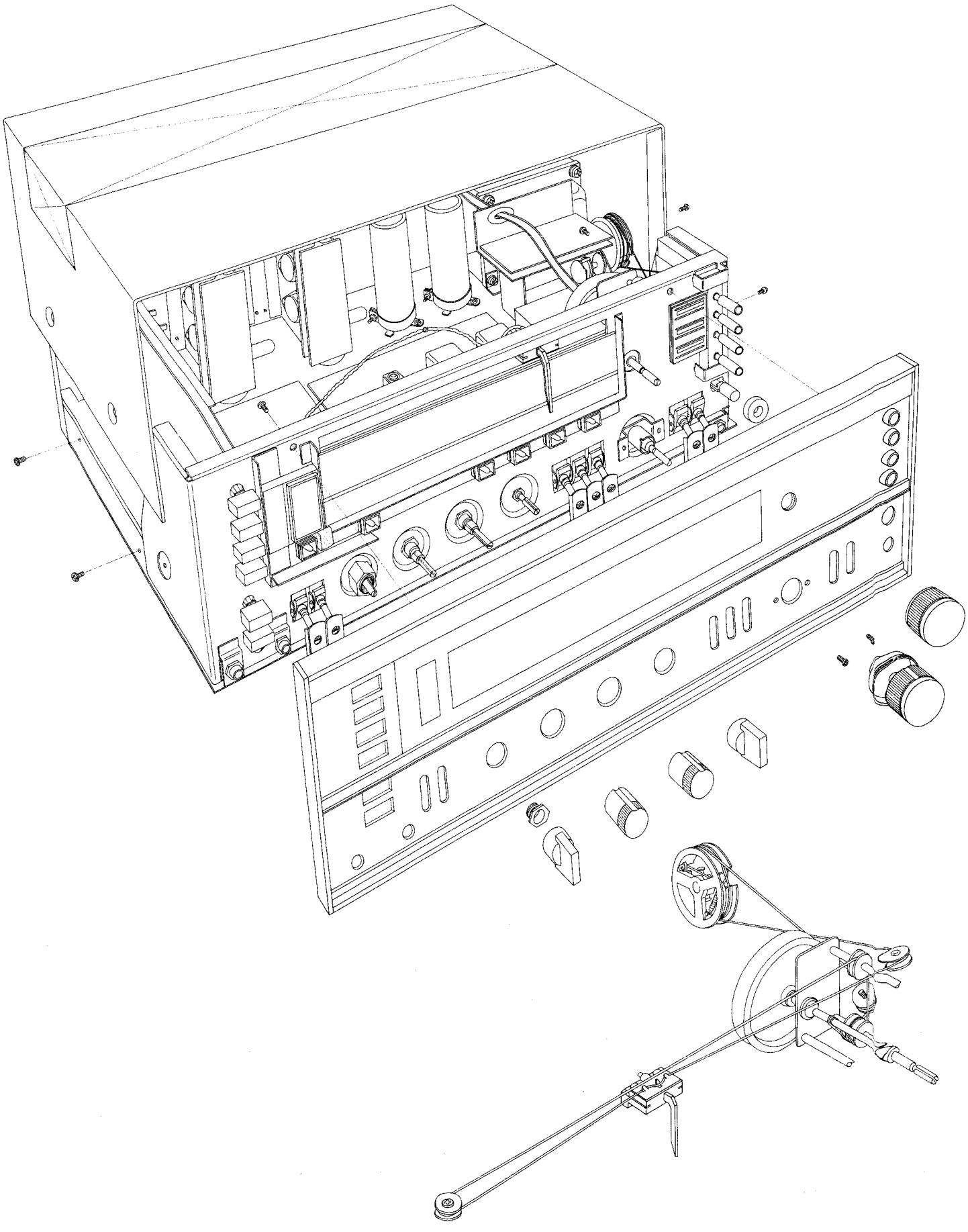
Step	Signal Source / Connected to	Set signal to	Set Radio Dial to	Output Indicator / Connected to	Adjust	Adjust for
1	Press FUNCTION SELECTOR SWITCH on TUNER FM					
2	Connect CP304 to the chassis					
3	Sweep Generator / PB323 Point F1 through 0.01uF capacitor	±400kHz sweep centered at 10.7MHz with marker at 10.6, 10.7 & 10.8MHz Generator output level approx. 80dB	Quiet point on band	Oscilloscope with signal tracing probe / Q302, Pin 1	CT301	Maximum symmetrical responce centered at 10.7MHz with 10.6 & 10.8MHz at equal heights
4				Oscilloscope with signal tracing probe / Q303, Pin 1	CT302	
5		±400kHz sweep centered at 10.7MHz with marker at 10.6, 10.7 & 10.8MHz Generator output level approx. 40dB		Oscilloscope / PB323 CP301	T301 Top core	Zero indication on S curve centered at 10.7MHz.
6					T301 Bottom core	Maximum S curve
7		±400kHz sweep centered at 10.7MHz with marker at 10.6, 10.7 & 10.8MHz Generator output level approx. 60dB		Oscilloscope / PB323 CP303	T305	Maximum symmetrical response centered at 10.7MHz with 10.6 & 10.8MHz at equal heights
8	Disconnect wire connected at Step 2					
9	10.7MHz ±1kHz marker (Crystal controlled or checked against a crystal calibrator / Near PB323 Point F1		Quiet point on band	DC VTVM / PB323 CP304		Make a note of the DC VTVM reading.
10				DC VTVM / PB323 CP301	T301 Top core	Equal DC VTVM reading that previous noted in Step 9.
11				DC VTVM / PB323 Point Q		Make a note of the DC VTVM reading.
12				DC VTVM / PB323 CP305 & CP306	VR301	Equal DC VTVM reading between CP305 and CP306
13				DC VTVM / PB323 CP305 & CP306	VR302	0.5V below DC VTVM reading that noted Step 11 on CP305 & CP306
14	Repeat Steps 12 and 13 as necessary to obtain specified DC VTVM reading					
15	Connect Point F9 to Point F18					
16	Push FM MANUAL TUNING button at pre-setter					

Step	Signal Source Connected to	Set Signal to	Set Radio Dial to	Output Indicator Connected to	Adjust	Adjust for
17	FM Signal Generator Across FM Antenna terminals through a matching network if necessary	108MHz ±75kHz deviation at 400Hz modulation. Generator output level approx. 2-10uV	108MHz	Oscilloscope AC VTVM TAPEOUT terminal	VR801	Dial pointer should be within one pointer width of 108MHz mark.
18					CT101	Maximum AC VTVM reading
19					CT102	
20		88MHz ±75kHz deviation at 400Hz modulation. Generator output level approx. 2-10uV	88MHz		VR803	Dial pointer should be within one pointer width of 88MHz mark.
21					L103	Maximum AC VTVM reading
22					L104	
23					T101 Top core	
24					T101 Bottom core	
25	Repeat Steps 17 through 22 as necessary to obtain maximum sensitivity on station					
26	Disconnect wire connected at Step 15					
27	FM Signal Generator Across FM Antenna terminals through a matching network if necessary	98MHz ±75kHz deviation at 400Hz modulation. Generator output level approx. 1mV	98MHz	Oscilloscope Distortion Meter TAPEOUT terminal	T301 Bottom Core	Minimum distortion
28		98 MHz Unmodulation Generator output level 1mV		TUNING METER	VR304	90% of full scale in TUNING METER reading.
29				CENTER TUNING INDICATOR & TUNING METER	T305	Retouch slightly to obtain symmetrical ballanced indication of CENTER TUNING INDICATOR centered at the frequency that shows maximum TUNING METER reading.
30		98MHz Unmodulation Generator output level 3uV			T101 Top core	
31					T101 Bottom core	
32	Set MUTING SWITCH to DISTANT					
33	FM Signal Generator Across FM antenna terminals through a matching network if necessary	98MHz ±75kHz deviation at 400Hz modulation. Generator output level 2uV.	98MHz	Oscilloscope AC VTVM TAPEOUT terminal	VR301	Signal at TAPEOUT terminal comes in and out.

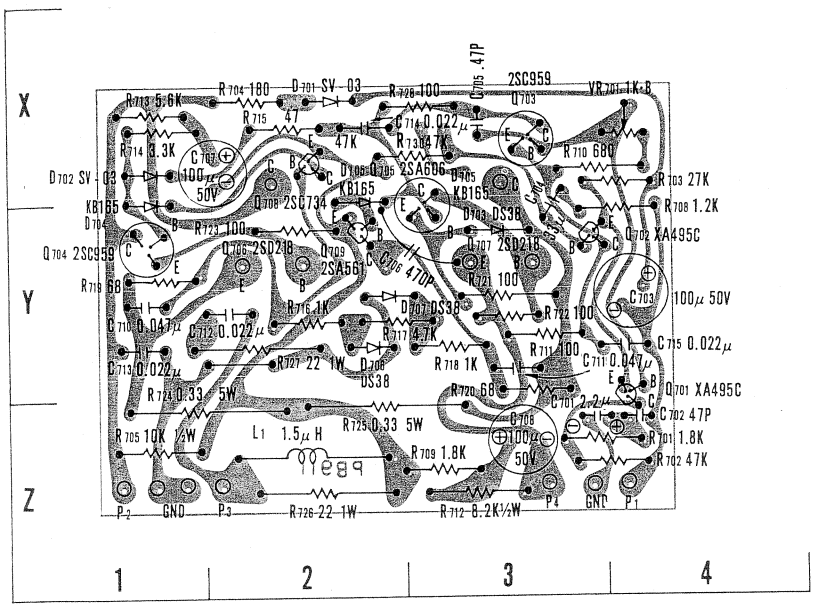
Step	Signal Source / Connected to	Set signal to	Set Radio Dial to	Output Indicator / Connected to	Adjust	Adjust for
34	Set MUTING SWITCH to LOCAL					
35	FM Signal Generator Across FM antenna terminals through a matching network if necessary	98 MHz ±75kHz deviation at 400Hz modulation. Generator output level 5uV.	98MHz	Oscilloscope AC VTVM TAPEOUT Terminal	VR902	Signal at TAPEOUT terminal comes in and out.
36	Connect Point R to the chassis					
37	FM Signal Generator & FM stereo modulator Across FM antenna terminals through a matching network if necessary	98MHz ±22.5kHz deviation at 19kHz modulation. Generator output level 1mV.	98MHz	Oscilloscope AC VTVM PB112a Point S	T404	Minimum AC VTVM reading
38		98MHz ±22.5kHz deviation at 65.5kHz modulation. Generator output level 1mV.			T405	
39		98MHz ±22.5kHz deviation at 71kHz modulation. Generator output level 1mV.			T406	
40	Disconnect wire connected at Step 36					
41	FM Signal Generator & FM stereo modulator Across FM antenna terminals through a matching network if necessary	FM stereo "Left only" signal centered at 98MHz, modulated 90% at 400Hz and 10% pilot. Generator output level approx. 1mV.	98MHz	Oscilloscope AC VTVM PB112a Point S	T401	Maximum AC VTVM reading. Stereo indicator must go on.
42					T402	
43					T403	
44					T401	Retouch slightly for correct phase.
45				Oscilloscope AC VTVM Right TAPEOUT terminal	VR402	Minimum AC VTVM reading
46	FM Signal Generator & FM stereo modulator. Across FM antenna terminals through a matching network if necessary	FM stereo "Right only" signal centered at 98MHz, modulated 90% at 400Hz and 10% pilot. Generator output level approx. 1mV.	98MHz	Oscilloscope AC VTVM Left TAPEOUT terminals	VR401	Minimum AC VTVM reading
47	Repeat Steps 45 and 46 as necessary to obtain best separation on both channel.					
48	There must be less than 2dB difference in output level between L and R.					

Step	Signal Source / Connected to	Set Signal to	Set Radio Dial to	Output Indicator / Connected to	Adjust	Adjust for
49	Press FUNCTION SELECTOR SWITCH on TUNER AM.					
50	Sweep Generator / PB455 Point A4 through 0.1uF capacitor	±20kHz sweep centered at 455kHz with marker at 450, 455 & 460kHz. Generator output level approx. 70dB.	Quiet point on band near 1600 kHz.	Oscilloscope / PB323, CP303	T203	Maximum symmetrical response centered at approx. 455kHz.
51					T302	
52				Oscilloscope / PB455, A7	T205	Equal response with Step 50 & 51.
53	Repeat Steps 50 through 52 as necessary to obtain specified response.					
54	Connect Point P to the chassis.					
55	Sweep Generator / PB455 Point A4 through 0.1uF capacitor	±20kHz sweep centered at 455kHz with marker at 450, 455 & 460kHz. Generator output level approx. 80dB.	Quiet point on band near 1600 kHz.	Oscilloscope / PB323, CP302	T304	Zero indication on S curve centered at approx. 455kHz.
56					T303	Maximum S curve
57	Connect point F9 to point F18.					
58	Standard radiating loop placed near built-in AM loop-stick antenna.	600kHz, at 400Hz, 30% modulation. Field strength approx. 50dB/m	600kHz	Oscilloscope / AC VTVM / TAPEOUT terminal	T202	Dial pointer should be within one pointer width of 600kHz mark
59					L201	Maximum AC VTVM reading.
60					T201	
61		1400kHz, at 400Hz, 30% modulation. Field strength approx. 50dB/m	1400kHz		CT203	Dial pointer should be within one pointer width of 1400kHz mark.
62					CT201	Maximum AC VTVM reading.
63					CT202	
64	Repeat Steps 58 through 63 as necessary to obtain maximum sensitivity on station					
65	Standard radiating loop placed near built-in AM loop-stick antenna.	1400kHz, at 10kHz, 30% modulation. Field strength approx. 70dB/m	1400kHz	Oscilloscope / AC VTVM / TAPEOUT terminal	T206	Minimum AC VTVM reading.
66	Disconnect all wires connected at Steps 54 & 57.					
67	Set MUTING SWITCH to DISTANT.					
68	Standard radiating loop placed near built-in AM loop-stick antenna.	1000kHz, at 400Hz, 30% modulation. Field strength 90dB/m	1000kHz	Oscilloscope / AC VTVM / TAPEOUT terminal	VR201	Full scale in TUNING METER reading.
69					T304	Retouch slightly to obtain symmetrical balanced indication of CENTER TUNING INDICATOR centered at the frequency that shows maximum TUNING METER reading.
70		600kHz, at 400Hz, 30% modulation. Field strength 65dB/m	600kHz		T201	

Step	Signal Source / Connected to	Set signal to	Set Radio Dial to	Output Indicator / Connected to	Adjust	Adjust for
71	Standard radiating loop placed near built-in AM loop-stick antenna.	550kHz, at 400Hz, 30% modulation. Field strength 65dB/m	550kHz	Oscilloscope / AC VTVM / TAPEOUT terminal	T201	Retouch slightly to obtain symmetrical balanced indication of CENTER TUNING INDICATOR centered at the frequency that shows maximum TUNING METER reading.
72	Repeat Steps 70 and 71 until results of both step are satisfactory.					
73	Standard radiating loop placed near built-in AM loop-stick antenna	1400kHz, at 400Hz, 30% modulation. Field strength 44dB/m	1400kHz	Oscilloscope / AC VTVM / TAPEOUT terminal	VR501	Signal at TAPEOUT terminal comes in and out.
74	Set MUTING SWITCH to LOCAL.					
75	Standard radiating loop placed near built-in AM loop-stick antenna	1400kHz, at 400Hz, 30% modulation. Field strength 46dB/m	1400kHz	Oscilloscope / AC VTVM / TAPEOUT terminal	VR903	Signal at TAPEOUT terminal comes in and out. Normally VR903 is turned fully clockwise.



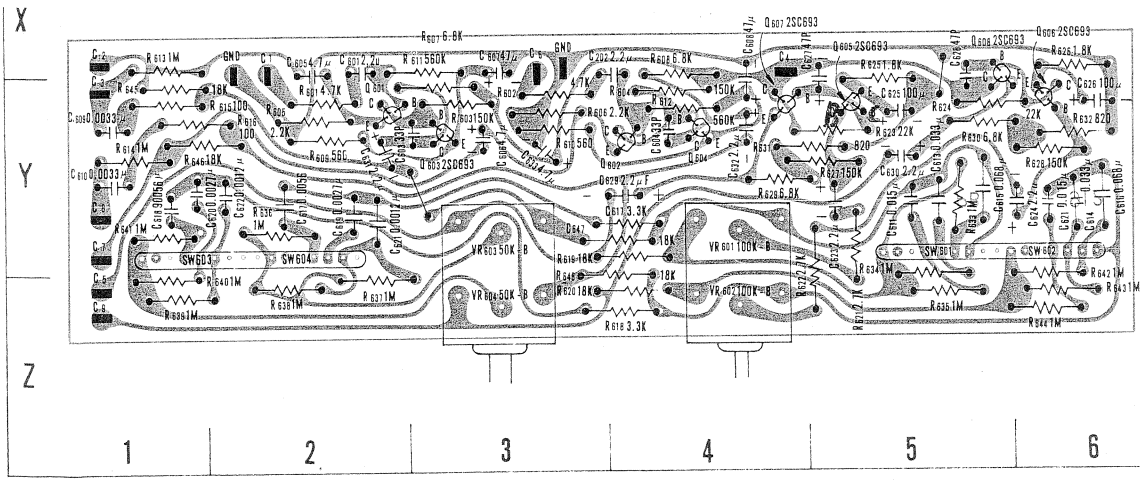
PB911 Circuit Board



PB911 Component Location

R701 - - - Z4	R726 - - - Z2	Q701 - - - X4
R702 - - - Z4	R727 - - - Y2	Q702 - - - Y3
R703 - - - X4	R728 - - - X3	Q703 - - - X3
R704 - - - X2	R729 - - - —	Q704 - - - Y1
R705 - - - Z1	R730 - - - X3	Q705 - - - Y3
R706 - - - —		Q706 - - - Y2
R707 - - - —	C701 - - - Z3	Q707 - - - Y3
R708 - - - Y4	C702 - - - Z4	Q708 - - - X2
R709 - - - Z3	C703 - - - Y4	Q709 - - - Y2
R710 - - - X3	C704 - - - Y3	
R711 - - - Y3	C705 - - - X3	D701 - - - X2
R712 - - - Z3	C706 - - - Y3	D702 - - - X1
R713 - - - X1	C707 - - - X2	D703 - - - Y3
R714 - - - X1	C708 - - - Z3	D704 - - - Y1
R715 - - - X2	C709 - - - —	D705 - - - Y2
R716 - - - Y2	C710 - - - Y1	D706 - - - Y2
R717 - - - Y2	C711 - - - Y3	D707 - - - Y2
R718 - - - Y2	C712 - - - Y2	
R719 - - - Y1	C713 - - - Y1	L1 - - - - - Z2
R720 - - - Y3	C714 - - - X2	P1 - - - - - Z4
R721 - - - Y3	C715 - - - Y4	P2 - - - - - Z1
R722 - - - Y3	C716 - - - —	P3 - - - - - Z2
R723 - - - Y2	C717 - - - —	P4 - - - - - Z3
R724 - - - Z1	C718 - - - —	
R725 - - - Z2	C719 - - - Y1	

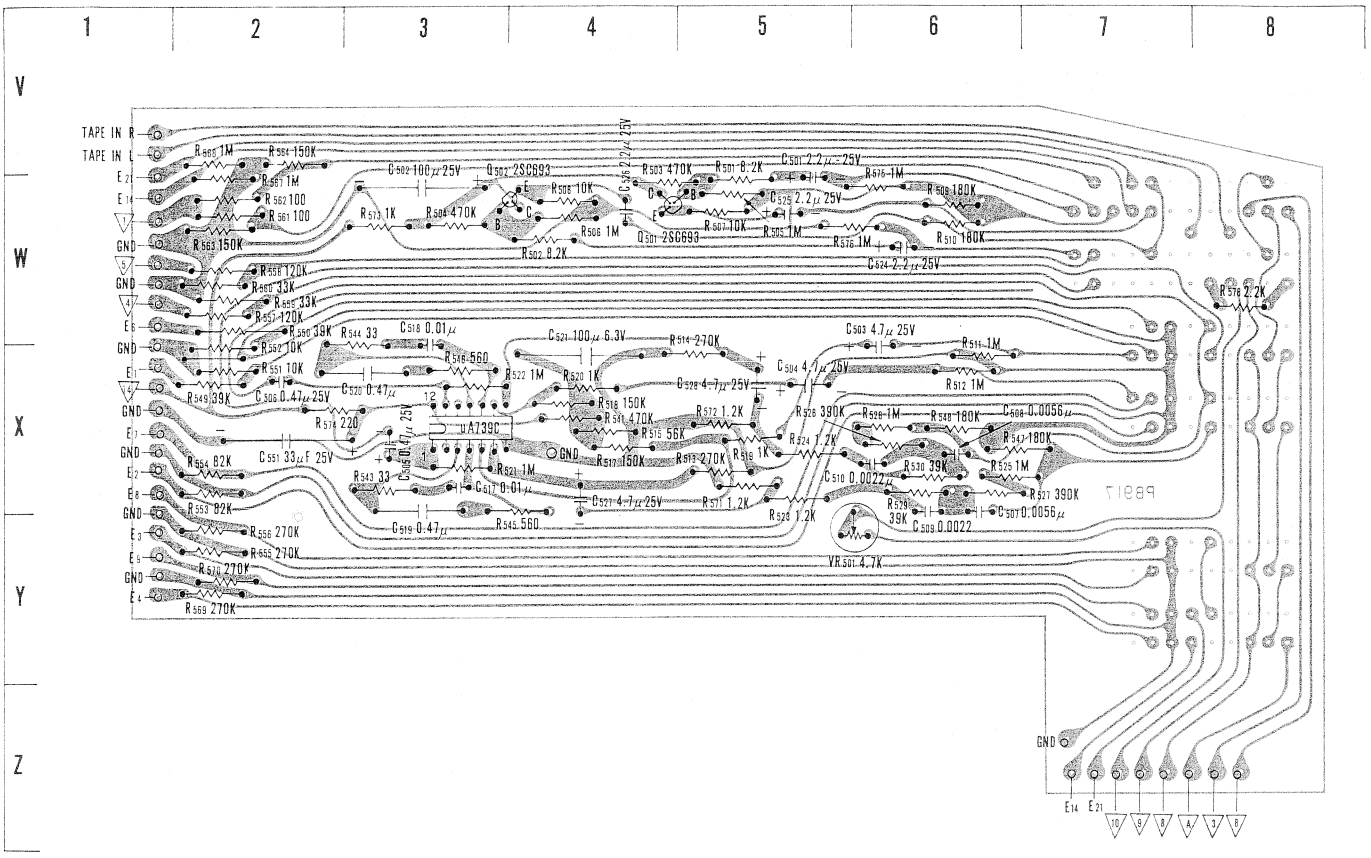
PB912 Circuit Board



PB912 Component Location

R601 - - - Y2	R620 - - - Z4	R638 - - - Z2	C608 - - - Y4	C626 - - - Y6	Q601 - - - Y2
R602 - - - Y3	R621 - - - Y5	R639 - - - Z1	C609 - - - Y1	C627 - - - Y5	Q602 - - - Y4
R603 - - - Y3	R622 - - - Z5	R640 - - - Z1	C610 - - - Y1	C628 - - - Y5	Q603 - - - Y3
R604 - - - Y4	R623 - - - Y5	R641 - - - Y1	C611 - - - Y5	C629 - - - Y4	Q604 - - - Y4
R605 - - - Y2	R624 - - - Y5	R642 - - - Z6	C612 - - - Y6	C630 - - - Y5	Q605 - - - Y5
R606 - - - Y3	R625 - - - X5	R643 - - - Z6	C613 - - - Y5	C631 - - - Y2	Q606 - - - Y6
R607 - - - Y3	R626 - - - X6	R644 - - - Z6	C614 - - - Y6	C632 - - - Y4	Q607 - - - Y4
R608 - - - X4	R627 - - - Y5	R645 - - - Y1	C615 - - - Y5	C633 - - - Y3	Q608 - - - Y5
R609 - - - Y2	R628 - - - Y6	R646 - - - Y2	C616 - - - Y6		
R610 - - - Y3	R629 - - - Y4	R647 - - - Y4	C617 - - - Y2	VR601 - - Y4	C1 - - - - - X2
R611 - - - X3	R630 - - - Y5	R648 - - - Z4	C618 - - - Y1	VR602 - - Z4	C2 - - - - - X1
R612 - - - Y4	R631 - - - Y5		C619 - - - Y2	VR603 - - Y3	C3 - - - - - Y1
R613 - - - X1	R632 - - - Y6	C601 - - - X2	C620 - - - Y1	VR604 - - Z3	C4 - - - - - X4
R614 - - - Y1	R633 - - - Y5	C602 - - - X4	C621 - - - Y2		C5 - - - - - Z1
R615 - - - Y1	R634 - - - Z5	C603 - - - Y3	C622 - - - Y2	SW601 - - Z5	C6 - - - - - X3
R616 - - - Y2	R635 - - - Z5	C604 - - - Y4	C623 - - - Y5	SW602 - - Z6	C7 - - - - - Y1
R617 - - - Y4	R636 - - - Y2	C605 - - - X2	C624 - - - Y6	SW603 - - Z1	C8 - - - - - Y1
R618 - - - Z4	R637 - - - Z2	C606 - - - Y3	C625 - - - Y5	SW604 - - Z2	C9 - - - - - Z1
R619 - - - Y4		C607 - - - X3			

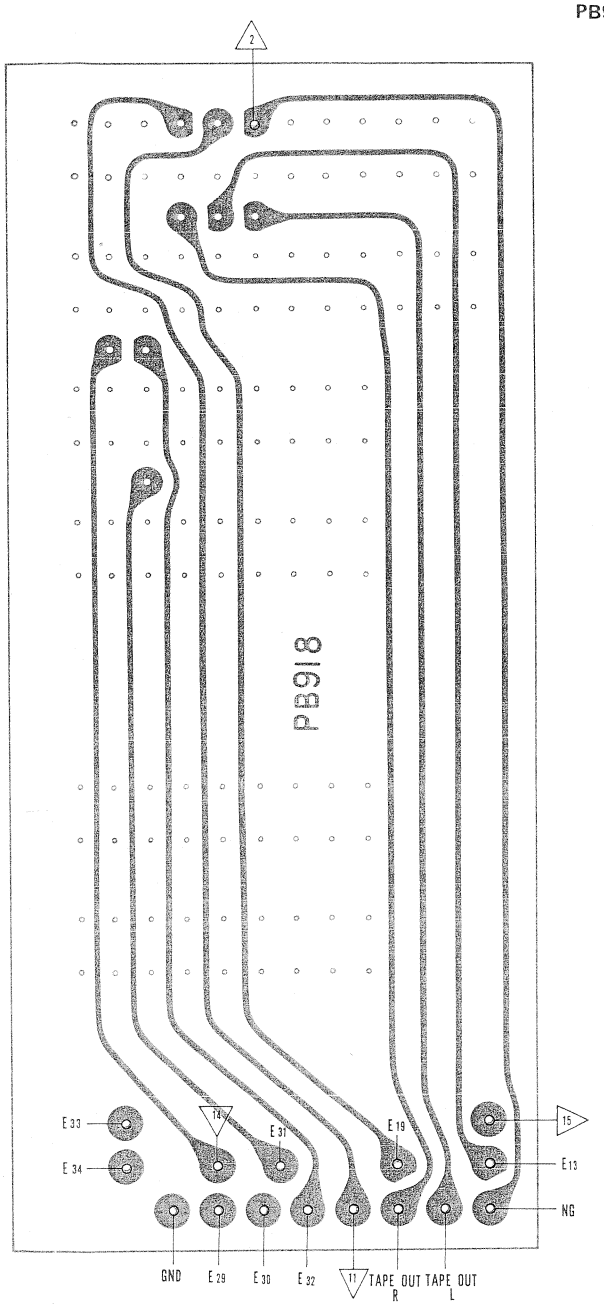
PB917 Circuit Board

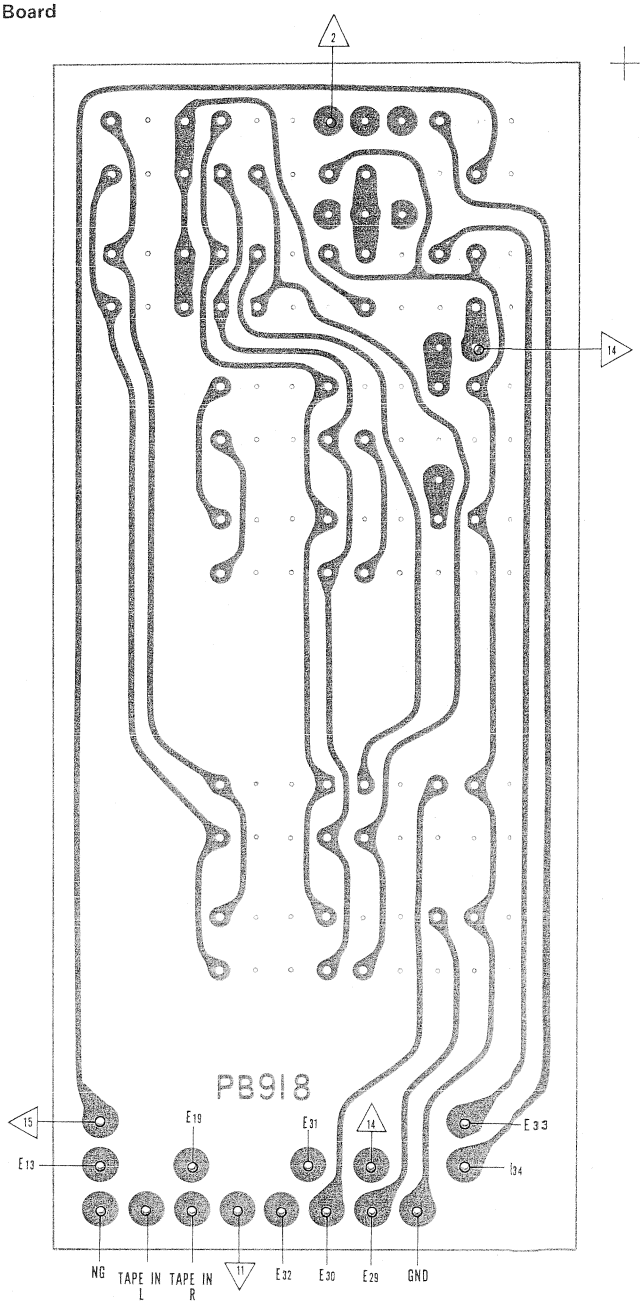


PB917 Component Location

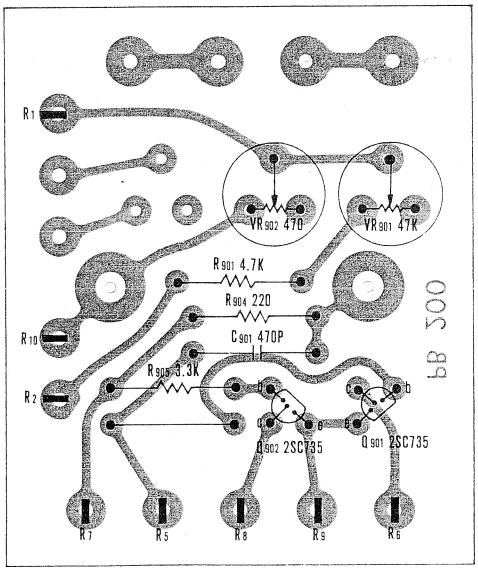
R501 - - - W5	R521 - - - X3	R551 - - - X2	R571 - - - X5	C518 - - - W3	E4 - - - - - Y1
R502 - - - W4	R522 - - - X3	R552 - - - X2	R572 - - - X5	C519 - - - X3	E6 - - - - - W1
R503 - - - W4	R523 - - - X5	R553 - - - X2	R573 - - - W3	C520 - - - X3	E7 - - - - - X1
R504 - - - W3	R524 - - - X5	R554 - - - X2	R574 - - - X2	C521 - - - X4	E8 - - - - - X1
R505 - - - W5	R525 - - - X6	R555 - - - Y2	R575 - - - W6	C522 - - - —	E9 - - - - - Y1
R506 - - - W4	R526 - - - X6	R556 - - - Y2	R576 - - - W6	C523 - - - —	E14 - - - - W1
R507 - - - W5	R527 - - - X6	R557 - - - W2	R577 - - - —	C524 - - - W6	E14 - - - - Z7
R508 - - - W4	R528 - - - X6	R558 - - - W2	R578 - - - W8	C525 - - - W5	E21 - - - - W1
R509 - - - W6	R529 - - - X6	R559 - - - W2		C526 - - - W4	E21 - - - - Z7
R510 - - - W6	R530 - - - X6	R560 - - - W2	C501 - - - W5	C527 - - - X4	▽1 - - - - W1
R511 - - - X6	R541 - - - X4	R561 - - - W2	C502 - - - W3	C528 - - - X5	▽3 - - - - Z8
R512 - - - X6	R542 - - - —	R562 - - - W2	C503 - - - X6	C551 - - - X2	▽4 - - - - W1
R513 - - - X5	R543 - - - X3	R563 - - - W2	C504 - - - X5		▽5 - - - - W1
R514 - - - X5	R544 - - - W3	R564 - - - V2	C505 - - - X3	VR501 - - Y6	▽8 - - - - Z8
R515 - - - X4	R545 - - - X3	R565 - - - —	C506 - - - X2	Q501 - - - W4	▽9 - - - - Z7
R516 - - - —	R546 - - - X3	R566 - - - —	C507 - - - X6	Q502 - - - W4	▽10 - - - - Z7
R517 - - - X4	R547 - - - X7	R567 - - - W2	C508 - - - X6	μA739C - - X3	▽14 - - - - X1
R518 - - - X4	R548 - - - X6	R568 - - - V2	C509 - - - X6	E1 - - - - - X1	▽A - - - - Z8
R519 - - - X5	R549 - - - X2	R569 - - - Y2	C510 - - - X6	E2 - - - - - X1	▽B - - - - Z7
R520 - - - X4	R550 - - - W2	R570 - - - Y2	C517 - - - X3	E3 - - - - - X1	

PB918 Terminal Board





PB200 Circuit Board



PB455 Component Location

R201 - - - X4
R202 - - - Y4
R203 - - - Y4
R204 - - - X5
R205 - - - Y4
R206 - - - Y3
R207 - - - —
R208 - - - Y3
R209 - - - Y3
R210 - - - Z3
R211 - - - Z3
R212 - - - Z2
R213 - - - Y2
R214 - - - Y2
R215 - - - Y2
R216 - - - X2
R217 - - - Y2
R218 - - - Y2
R219 - - - Y1
R220 - - - Z1
R221 - - - X1
R222 - - - X2
R223 - - - Y1
R224 - - - Y1
R225 - - - X2
R226 - - - X3
R227 - - - Y1

C201 - - - Y5
C202 - - - Y4
C203 - - - Z4
C204 - - - Y4
C205 - - - Y5
C206 - - - X3
C207 - - - Y3
C208 - - - X3
C209 - - - X3
C210 - - - X3
C211 - - - Z4
C212 - - - Z3
C213 - - - Z2
C214 - - - Z3
C215 - - - Y2
C216 - - - Y2
C217 - - - —
C218 - - - Y2
C219 - - - Y1
C220 - - - Y1
C221 - - - Z1
C222 - - - Y2
C223 - - - Z2
C224 - - - Z2
C225 - - - X4
C226 - - - X1
C227 - - - X2
C228 - - - X4
C229 - - - X1

CT201 - - X4
CT202 - - Z4
CT203 - - X3

VR201 - - Z2

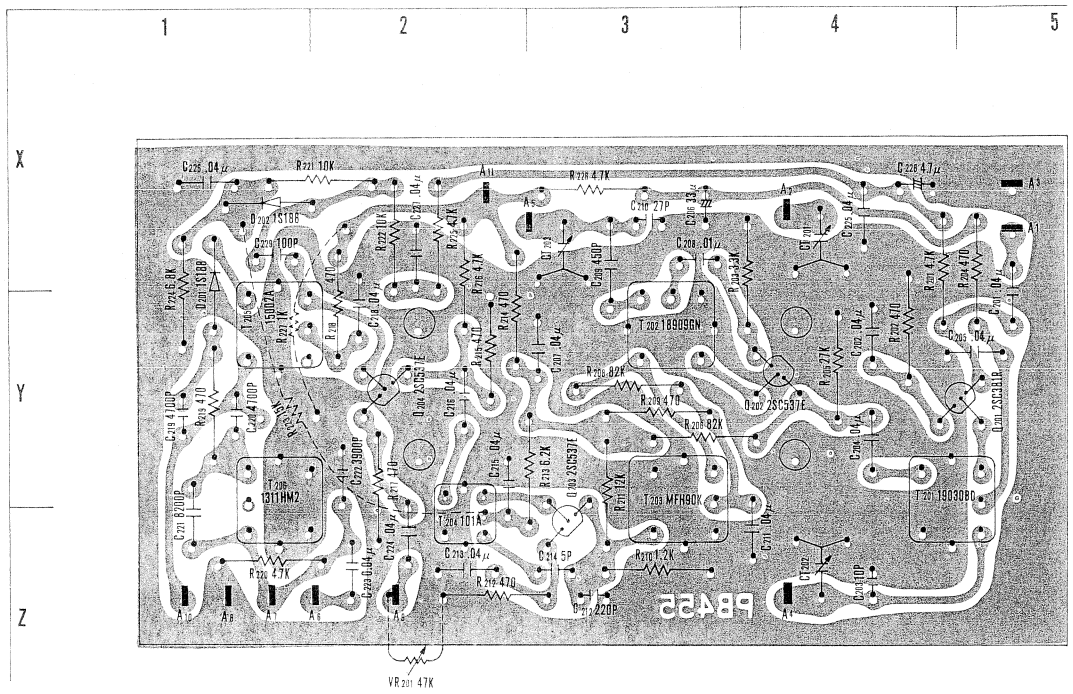
Q201 - - - Y5
Q202 - - - Y4
Q203 - - - Z3
Q204 - - - Y2

D201 - - - Y1
D202 - - - X1

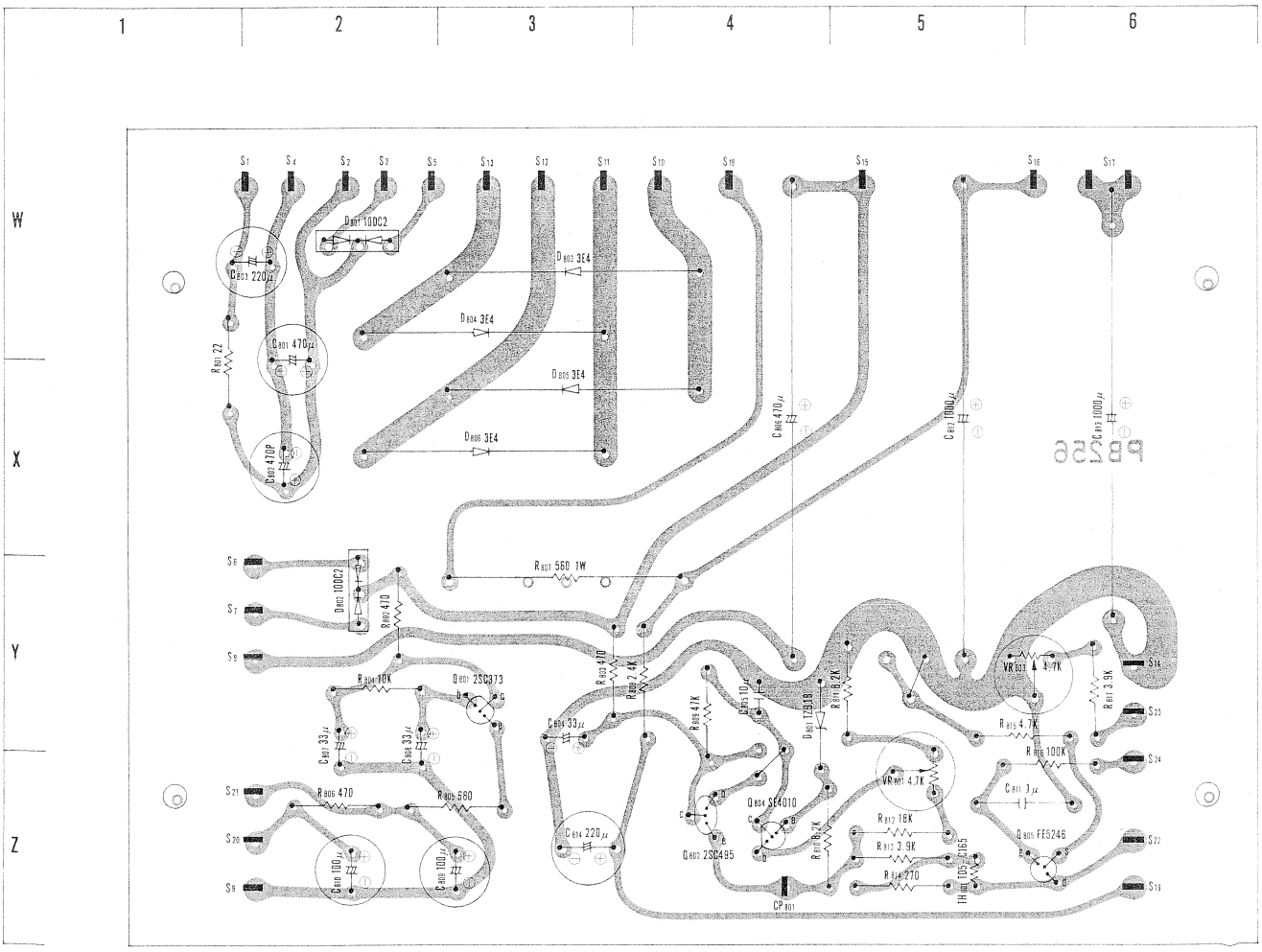
T201 - - - Y4
T202 - - - Y3
T203 - - - Z3
T204 - - - Z2
T205 - - - Y1
T206 - - - Y1

A1 - - - - - X5
A2 - - - - - X4
A3 - - - - - X5
A4 - - - - - Z4
A5 - - - - - X3
A6 - - - - - Z2
A7 - - - - - Z1
A8 - - - - - Z1
A9 - - - - - Z2
A10 - - - - Z1
A11 - - - - X2

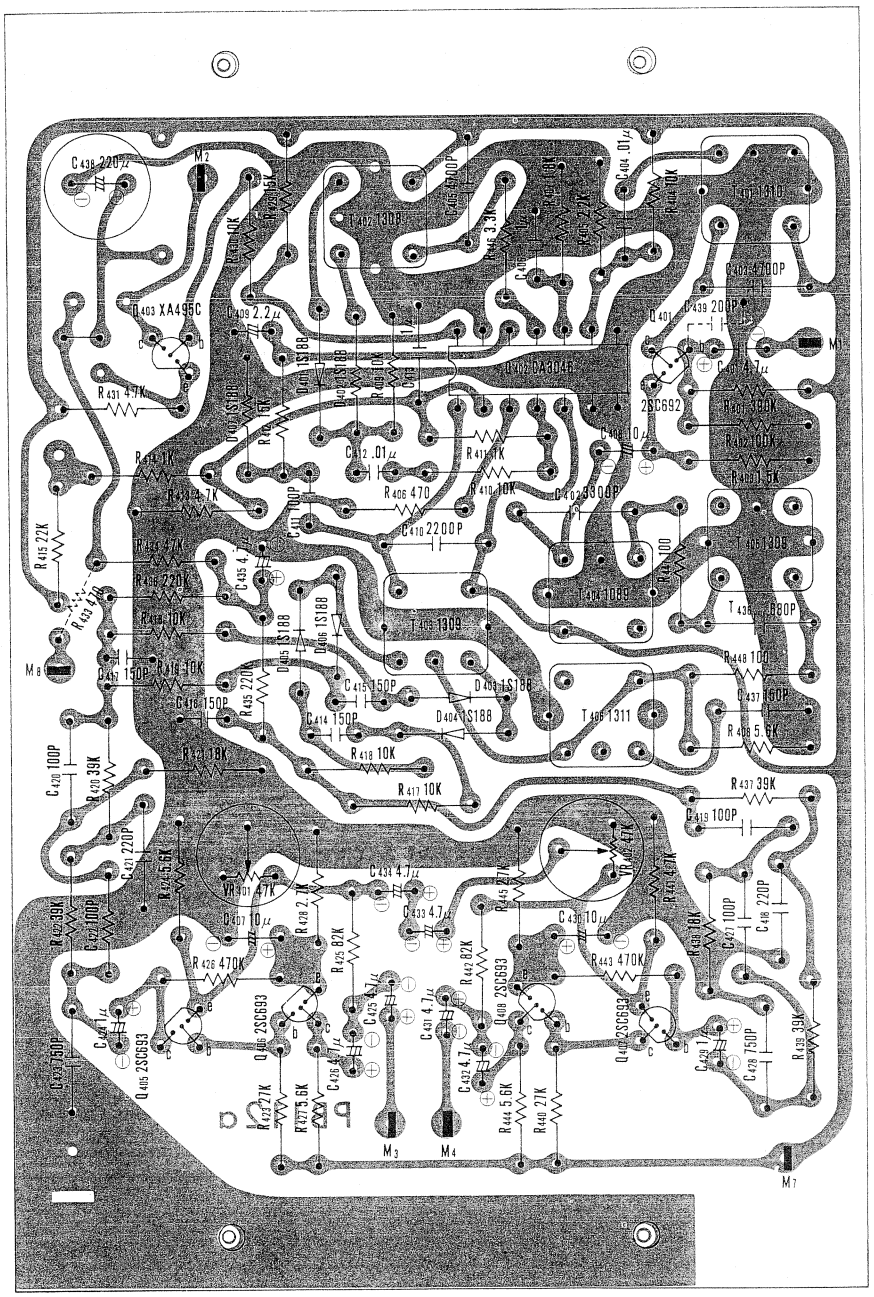
PB455 Circuit Board



PB256 Circuit Board



◀ PB112a Circuit Board



◀ PB256 Component Location

R801 - - - X1
R802 - - - Y2
R803 - - - Y3
R804 - - - Y2
R805 - - - Z2
R806 - - - Z1
R807 - - - Y3
R808 - - - Y4
R809 - - - Y4
R810 - - - Z4
R811 - - - Y5
R812 - - - Z5
R813 - - - Z5
R814 - - - Z5
R815 - - - Y5
R816 - - - Z6
R817 - - - Y6

C801 - - - W2
C802 - - - X2
C803 - - - W2
C804 - - - Y3
C805 - - - Y4
C806 - - - X4
C807 - - - Y2
C808 - - - Y2
C809 - - - Z3
C810 - - - Z2
C811 - - - Z5
C812 - - - X5
C813 - - - X6
C814 - - - Z3

VR801 - - Z5
VR802 - - —
VR803 - - Y6

TH801 - - Z5

Q801 - - - Y3
Q802 - - - Z4
Q803 - - - —
Q804 - - - Z4
Q805 - - - Z6

CP801 - - Z4

D801 - - - W2
D802 - - - Y2
D803 - - - W3
D804 - - - W3
D805 - - - X3
D806 - - - X3
D807 - - - Y4

S1 - - - - - W1
S2 - - - - - W2
S3 - - - - - W2
S4 - - - - - W2
S5 - - - - - W2
S6 - - - - - Y2
S7 - - - - - Y2
S8 - - - - - Y2
S9 - - - - - Z2
S10 - - - - W4
S11 - - - - W3
S12 - - - - W3
S13 - - - - W3
S14 - - - - Y6
S15 - - - - W5
S16 - - - - W6
S17 - - - - W6
S18 - - - - W4
S19 - - - - Z6
S20 - - - - Z2
S21 - - - - Z2
S22 - - - - Z6
S23 - - - - Y6
S24 - - - - Z6

PB112a Component Location

R401 - - - W4
R402 - - - X4
R403 - - - X4
R404 - - - W4
R405 - - - W3
R406 - - - X3
R407 - - - W3
R408 - - - Y4
R409 - - - W3
R410 - - - X3
R411 - - - X3
R412 - - - X2
R413 - - - X2
R414 - - - X2
R415 - - - X1
R416 - - - X2
R417 - - - Y3
R418 - - - Y2
R419 - - - Y2
R420 - - - Y1
R421 - - - Y2
R422 - - - Z1
R423 - - - Z2
R424 - - - Y2
R425 - - - Z2
R426 - - - Z2
R427 - - - Z2
R428 - - - Y2
R429 - - - W2
R430 - - - W2
R431 - - - X2
R432 - - - —
R433 - - - X1
R434 - - - X2
R435 - - - Y2
R436 - - - X2
R437 - - - Y4
R438 - - - Z4
R439 - - - Z4
R440 - - - Z3
R441 - - - Y4
R442 - - - Z3
R443 - - - Z3
R444 - - - Z3
R445 - - - Y3
R446 - - - W3
R447 - - - X4
R448 - - - Y4

C401 - - - W4
C402 - - - X3
C403 - - - W4
C404 - - - W3
C405 - - - W3
C406 - - - W3
C407 - - - Z2
C408 - - - X3
C409 - - - W2
C410 - - - X3
C411 - - - X2
C412 - - - X3
C413 - - - W3
C414 - - - Y2
C415 - - - Y2
C416 - - - Y2
C417 - - - Y2
C418 - - - Z4
C419 - - - Y4
C420 - - - Y1
C421 - - - Y2
C422 - - - Z1
C423 - - - Z1
C424 - - - Z2
C425 - - - Z3
C426 - - - Z2
C427 - - - Z4
C428 - - - Z4
C429 - - - Z4
C430 - - - Z3
C431 - - - Z3
C432 - - - Z3
C433 - - - Z3
C434 - - - Y3
C435 - - - X2
C436 - - - X4
C437 - - - Y4
C438 - - - W1
C439 - - - W4

VR401 - - Y2
VR402 - - Y3

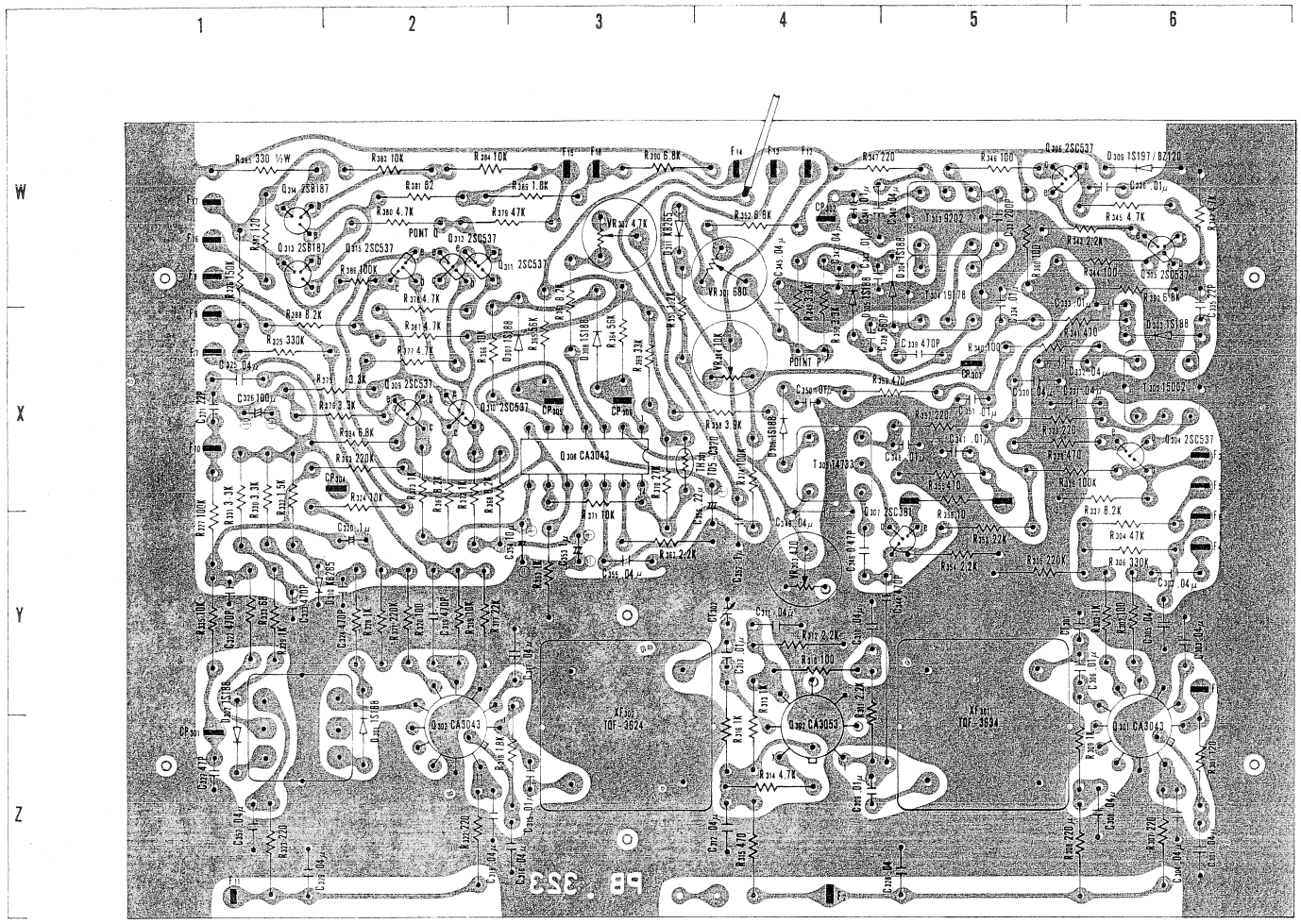
Q401 - - - W4
Q402 - - - W3
Q403 - - - W2
Q404 - - - —
Q405 - - - Z2
Q406 - - - Z2
Q407 - - - Z4
Q408 - - - Z3

D401 - - - W2
D402 - - - W2
D403 - - - Y3
D404 - - - Y3
D405 - - - X2
D406 - - - X2
D407 - - - X2

T401 - - - W4
T402 - - - W3
T403 - - - X3
T404 - - - X3
T405 - - - X4
T406 - - - Y3

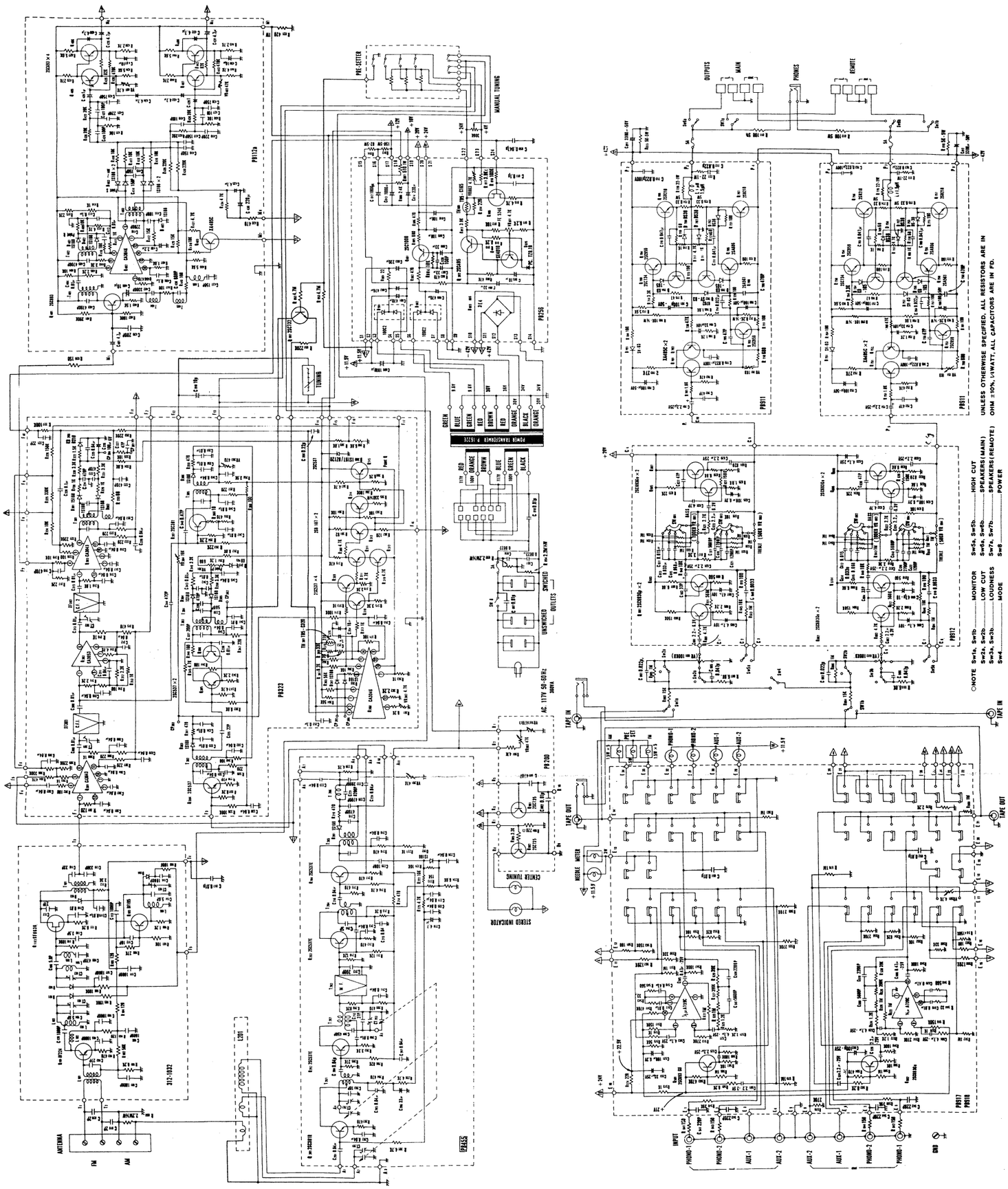
M1 - - - - - W4
M2 - - - - - W2
M3 - - - - - Z3
M4 - - - - - Z3
M5 - - - - - —
M6 - - - - - —
M7 - - - - - Z4
M8 - - - - - Y1

PB323 Circuit Board

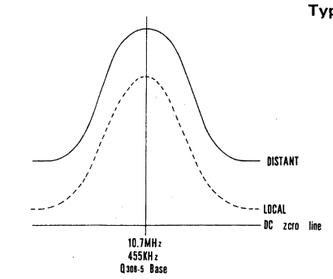


PB323 Component Location

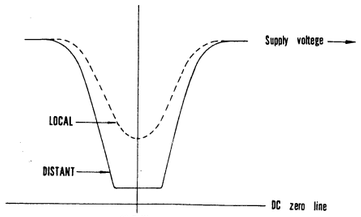
R301 - - - Z6
R302 - - - Y6
R303 - - - Y6
R304 - - - Y6
R305 - - - Y5
R306 - - - Y6
R307 - - - Z6
R308 - - - Z6
R309 - - - Z6
R310 - - - Y4
R311 - - - Z4
R312 - - - Y4
R313 - - - Z4
R314 - - - Z4
R315 - - - Z4
R316 - - - Z4
R317 - - - Y2
R318 - - - Z3
R319 - - - Y2
R320 - - - Y2
R321 - - - Y2
R322 - - - Z2
R323 - - - Z1
R324 - - - X2
R325 - - - X1
R326 - - - W1
R327 - - - Y1
R328 - - - Y2
R329 - - - Y1
R330 - - - X1
R331 - - - X1
R332 - - - X1
R333 - - - Y1
R334 - - - X2
R335 - - - Y1
R336 - - - X5
R337 - - - X6
R338 - - - X5
R339 - - - X5
R340 - - - X5
R341 - - - X6
R342 - - - W6
R343 - - - W6
R344 - - - W6
R345 - - - W6
R346 - - - W5
R347 - - - W4
R348 - - - —
R349 - - - X4
R350 - - - X4
R351 - - - X3
R352 - - - W4
R353 - - - Y5
R354 - - - Y5
R355 - - - X5
R356 - - - X5
R357 - - - X5
R358 - - - X4
R359 - - - X5
R360 - - - W5
R361 - - - X3
R362 - - - Y3
R363 - - - Y3
R364 - - - X3
R365 - - - X3
R366 - - - X2
R367 - - - X2
R368 - - - X2
R369 - - - X3
R370 - - - X3
R371 - - - X3
R372 - - - X2
R373 - - - X2
R374 - - - X4
R375 - - - X2
R376 - - - X2
R377 - - - X2
R378 - - - X2
R379 - - - W2
R380 - - - W2
R381 - - - W2
R382 - - - W1
R383 - - - W2
R384 - - - W2
R385 - - - W1
R386 - - - W2
R387 - - - X2
R388 - - - X1
R389 - - - W3
R390 - - - W3
R391 - - - —
R392 - - - W6
R393 - - - X2
C301 - - - Z6
C302 - - - Y6
C303 - - - Y6
C304 - - - Z6
C305 - - - Y6
C306 - - - Y6
C307 - - - —
C308 - - - Z6
C309 - - - Z4
C310 - - - Y4
C311 - - - Y4
C312 - - - Z4
C313 - - - Y4
C314 - - - —
C315 - - - Z3
C316 - - - Z2
C317 - - - Y3
C318 - - - Z2
C319 - - - Y2
C320 - - - Y2
C321 - - - X1
C322 - - - Y1
C323 - - - Y1
C324 - - - Y2
C325 - - - X1
C326 - - - X1
C327 - - - Z1
C328 - - - Z5
C329 - - - Z1
C330 - - - X5
C331 - - - X6
C332 - - - X5
C333 - - - X6
C334 - - - X5
C335 - - - X6
C336 - - - W6
C337 - - - W5
C338 - - - X4
C339 - - - X5
C340 - - - W4
C341 - - - W4
C342 - - - W4
C343 - - - W4
C344 - - - Y5
C345 - - - X4
C346 - - - Y4
C347 - - - X5
C348 - - - X5
C349 - - - Y4
C350 - - - X4
C351 - - - X5
C352 - - - Y4
C353 - - - Y3
C354 - - - Y3
C355 - - - Y3
C356 - - - X4
C357 - - - Z1
VR301 - - W4
VR302 - - W3
VR303 - - Y4
VR304 - - X4
TH301 - - X3
Q301 - - - Z6
Q302 - - - Z4
Q303 - - - Z2
Q304 - - - X6
Q305 - - - W6
Q306 - - - W5
Q307 - - - Y5
Q308 - - - X3
Q309 - - - X2
Q310 - - - X2
Q311 - - - W2
Q312 - - - W2
Q313 - - - W1
Q314 - - - W1
Q315 - - - W2
D301 - - - Z2
D302 - - - Z1
D303 - - - X6
D304 - - - W5
D305 - - - W4
D306 - - - X4
D307 - - - X3
D308 - - - X3
D309 - - - W6
D310 - - - Y1
D311 - - - W3
XF301 - - Z5
XF302 - - Z3
T301 - - - Z1
T302 - - - X6
T303 - - - W5
T304 - - - W5
T305 - - - X4
CP301 - - Z1
CP302 - - W4
CP303 - - X5
CP304 - - X2
CP305 - - X3
CP306 - - X3
F1 - - - - - Y6
F2 - - - - - Z4
F3 - - - - - X6
F4 - - - - - Y6
F5 - - - - - X6
F6 - - - - - Y6
F7 - - - - - X1
F8 - - - - - W1
F9 - - - - - X1
F10 - - - - X1
F11 - - - - Z1
F12 - - - - W4
F13 - - - - W4
F14 - - - - W4
F15 - - - - W3
F16 - - - - W1
F17 - - - - W1
F18 - - - - W3
POINT P - - X4
POINT Q - - W2


OUTPUTS
MAIN
PHONES
REMOTE
MANUAL TUNING
PRE-SETTER
TUNING
STEREO INDICATOR
CENTER TUNING
TAPE IN
TAPE OUT
METER
NEEDLE METER
ANTENNA
FM
AM
INPUT
PHONO-1
PHONO-2
AUX-1
AUX-2
GND
UNSWITCHED
SWITCHED
AC 117V 50-60HZ 30WA
GREEN
BLUE
BROWN
RED
ORANGE
BLACK
NOTE Sw1a, Sw1b.....MONITOR
Sw2a, Sw2b.....LOW CUT
Sw3a, Sw3b.....LOUDNESS
Sw4.....MODE
Sw5a, Sw5b.....HIGH CUT
Sw6a, Sw6b.....SPEAKERS(MAIN)
Sw7a, Sw7b.....SPEAKERS(REMOTE)
Sw8.....POWER
UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHM ±10%, 1/4WATT, ALL CAPACITORS ARE IN PD.

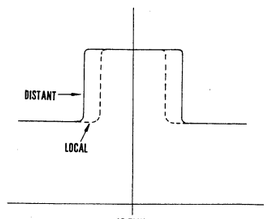
Typical Swept Responses (Tuning Indicator & Muting Circuits)



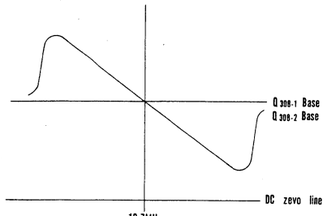
10.7MHz
455KHz
Q308-5 Base



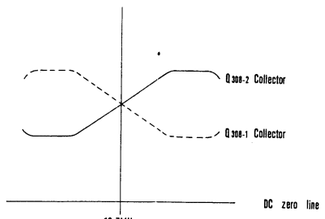
10.7MHz
455KHz
Q308-5 Collector



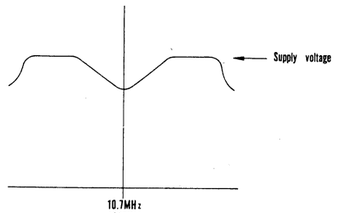
10.7MHz
455KHz
Q310 Emitter
(Q308-4 Collector)



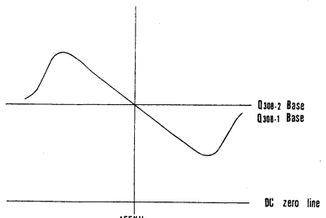
10.7MHz
FM



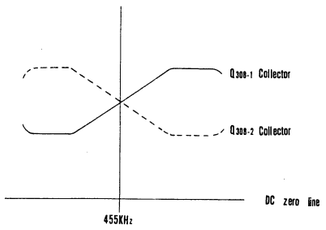
10.7MHz



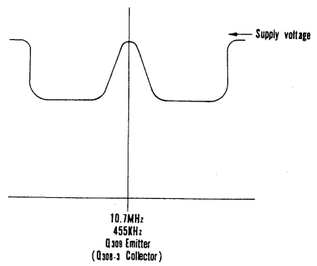
10.7MHz
455KHz
Q308-3 Base



455KHz
AM

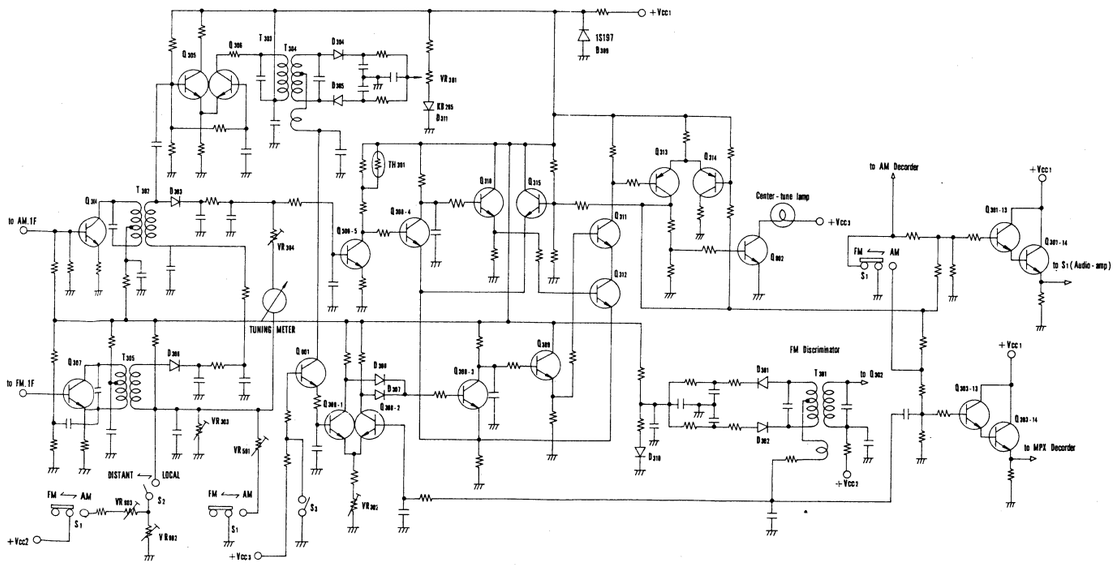


455KHz



10.7MHz
455KHz
Q309 Emitter
(Q308-3 Collector)

Tuning Indicator & Muting Circuits



S1.....FUNCTION SELECTOR SWITCH S2.....MUTING SWITCH S3.....PRESETTER TRANSIENT CONTACT

LUX CORPORATION, JAPAN

head office & factory 2-22, nagahashi-dori, nishinari-ku, osaka phones: 632 0031 cable: luxelect osaka
international division baba bldg. no.13, 2-23, yushima, bunkyo-ku, tokyo phones: 833 7691 cable: tokluxman tokyo